What is Claimed is:

1. A method of forming a nonwoven fabric from a process employing fiber splitting in line with fiber extrusion, the method comprising the steps of:

extruding an array of plural-component fibers, each comprising first and second materials having a relative difference in heat shrinkage;

depositing the array of plural-component fibers onto a moving surface to form a web;

applying heat to the web to cause separation between segments of the plural-component fibers comprising the first material and segments of the plural-component fibers comprising the second material due to differential heat shrinkage of the first and second materials; and

processing the web to form the nonwoven fabric.

2. The method according to claim 1, wherein said processing step includes bonding of the web to form a spunbonded fabric.

3. The method according to claim 1, wherein the first and second materials have a difference in heat shrinkage of at least approximately ten percent.

4. The method according to claim 1, wherein said applying step includes blowing hot air, steam or a combination of hot air and steam through the web.

5. The method according to claim 1, wherein said applying step includes applying radiant heat to the web.

6. The method according to claim 1, wherein said first and second materials are non-hydrophilic.

7. The method according to claim 1, wherein said extruding step includes forming the plural-component fibers as ribbon-shaped fibers.

8. The method according to claim 7, wherein the ribbon-shaped fibers comprise segments of the first material interleaved with segments of the second material.

9. The method according to claim 8, wherein the ribbon-shaped fibers are bicomponent fibers comprising alternating segments of the first material and segments of the second material.

10. The method according to claim 1, wherein said extruding step includes forming plural-component fibers having a cross section in the shape of a cross, including a central segment comprising the first material and a plurality of radial segments comprising the second material and extending radially outward from the central segment.

11. The method according to claim 10, wherein the plural-component fibers formed in said extruding step further include a plurality of radial segments comprising the first material and extending radially outward from said plurality of radial segments comprising the second material.

12. The method according to claim 1, wherein said applying step includes moving the web past a heating unit at a rate that allows the segments of the plural-component fibers of a portion of the web to separate while the portion of the web is receiving heat from the heating unit.

13. The method according to claim 12, wherein the portion of the web receives heat from the heating unit for less than approximately one second.

14. The method according to claim 1, wherein differential heat shrinkage of the segments of a portion of the web and resultant fiber separation is substantially completed from application of less than approximately one second of heat.

15. The method according to claim 1, wherein said extruding step includes extruding plural-component fibers comprising: polypropylene; and polyethylene terepthalate modified with isopthalic acid and a powdered transesterification inhibitor.

16. The method according to claim 1, further comprising the step of attenuating the extruded array of plural-component fibers prior to depositing the array of plural-component fibers onto the moving surface.

17. The method according to claim 16, wherein said attenuating step includes drawing the array of plural-component fibers through an aspirator.

18. The method according to claim 16, wherein said attenuating step includes using at least one godet to draw or relax the array of plural-component fibers.

19. The method according to claim 1, wherein application of heat to the web causes the plural-component fibers to crimp.

20. The method according to claim 1, wherein no substantial separation of the segments of the plural-component fibers occurs prior to application of the heat to the web.

21. The method according to claim 1, wherein said processing step comprises through-air bonding of the web by heating the web to a temperature at which segments formed of one of said first and second materials begin to melt and adhere to adjacent segments.

22. A method of forming a nonwoven fabric from a process employing fiber splitting in line with fiber extrusion, the method comprising the steps of:

extruding an array of plural-component fibers, each comprising first and second materials having a relative difference in heat shrinkage;

applying heat to the array of plural-component fibers to cause separation between segments of the plural-component fibers comprising the first material and segments of the plural-component fibers comprising the second material due to differential heat shrinkage of the first and second materials;

depositing the separated plural-component fibers onto a moving surface to form a web; and

processing the web to form the nonwoven fabric.

23. The method according to claim 22, wherein said processing step includes bonding of the web to form a spunbonded fabric.

24. The method according to claim 22, wherein the first and second materials have a difference in heat shrinkage of at least approximately ten percent.

25. The method according to claim 22, wherein said applying step includes blowing hot air, steam or a combination of hot air and steam through the array of plural-component fibers.

26. The method according to claim 22, wherein said applying step includes applying radiant heat to the array of plural-component fibers.

27. The method according to claim 22, wherein said first and second materials are non-hydrophilic.

28. The method according to claim 22, wherein said extruding step includes forming the plural-component fibers as ribbon-shaped fibers.

29. The method according to claim 28, wherein the ribbon-shaped fibers comprise segments of the first material interleaved with segments of the second material.

30. The method according to claim 29, wherein the ribbon-shaped fibers are bicomponent fibers comprising alternating segments of the first material and segments of the second material.

31. The method according to claim 22, wherein said extruding step includes forming plural-component fibers having a cross section in the shape of a cross, including a central segment comprising the first material and a plurality of radial segments comprising the second material and extending radially outward from the central segment.

32. The method according to claim 31, wherein the plural-component fibers formed in said extruding step further include a plurality of radial segments comprising the first material and extending radially outward from said plurality of radial segments comprising the second material.

33. The method according to claim 22, wherein differential heat shrinkage of the segments at a point along the plural-component fibers and resultant fiber separation is substantially completed from application of less than approximately one second of heat.

34. The method according to claim 22, wherein said extruding step includes extruding plural-component fibers comprising: polypropylene; and polyethylene terepthalate modified with isopthalic acid and a powdered transesterification inhibitor.

35. The method according to claim 22, further comprising the step of attenuating the extruded array of plural-component fibers prior to depositing the array of plural-component fibers onto the moving surface.

36. The method according to claim 35, wherein said attenuating step includes drawing the array of plural-component fibers through an aspirator.

37. The method according to claim 36, wherein the aspirator applies hot air and/or steam to the array of plural-component fibers to cause differential heat shrinkage of the segments of the plural-component fibers prior to reaching the moving surface.

38. The method according to claim 35, wherein said attenuating step includes using at least one godet to draw or relax the array of plural-component fibers.

39. The method according to claim 38, wherein said at least one godet applies heat to the array of plural-component fibers to cause differential heat shrinkage and separation.

40. The method according to claim 22, wherein application of heat to the plural-component fibers causes the plural-component fibers to crimp.

41. The method according to claim 22, wherein said processing step comprises through-air bonding of the web by heating the web to a temperature at which segments formed of one of said first and second materials begin to melt and adhere to adjacent segments.

42. An apparatus for forming a nonwoven fabric from a process employing fiber splitting in line with fiber extrusion, comprising:

a spinpack having a spinneret with an array of orifices configured to extrude an array of plural-component fibers each comprising first and second materials having a relative difference in heat shrinkage;

a web-forming surface moving relative to said spinneret and adapted to receive the array of plural-component fibers extruded from the orifices to form a fiber web on said web-forming surface;

a heating unit configured to apply heat to the fiber web to cause differential heat shrinkage of the first and second materials, such that segments of the plural-component fibers comprising the first material separate from segments of the plural-component fibers comprising the second material; and

means for processing the web to form the nonwoven fabric.

43. The apparatus according to claim 42, wherein said spinneret extrudes plural component fibers comprising the first and second materials having a difference in heat shrinkage of at least approximately ten percent.

44. The apparatus according to claim 42, wherein said means for processing comprises means for bonding the web to form a spunbonded fabric.

45. The apparatus according to claim 44, wherein said means for bonding performs through-air bonding of the web by heating the web to a temperature at which segments formed of one of said first and second materials begin to melt and adhere to adjacent segments.

46. The apparatus according to claim 42, wherein said spinneret extrudes plural-component fibers comprising the first and second materials which are non-hydrophilic materials.

47. The apparatus according to claim 42, wherein said spinneret is configured to extrude ribbon-shaped plural-component fibers from the orifices.

48. The apparatus according to claim 47, wherein the ribbon-shaped plural-component fibers extruded from said spinneret comprise segments of the first material interleaved with segments of the second material.

49. The apparatus according to claim 48, wherein the ribbon-shaped plural-component fibers extruded from said spinneret are bicomponent fibers comprising alternating segments of the first material and segments of the second material.

50. The apparatus according to claim 42, wherein said spinneret is configured to extrude plural-component fibers having a cross section in the shape of a cross,

including a central segment comprising the first material and a plurality of radial segments comprising the second material and extending radially outward from the central segment.

51. The apparatus according to claim 50, wherein the plural-component fibers extruded from said spinneret further include a plurality of radial segments comprising the first material and extending radially outward from said plurality of radial segments comprising the second material.

52. The apparatus according to claim 42, wherein said web-forming surface moves relative to said heating unit such that the fiber web moves past said heating unit at a rate that allows the segments of the plural-component fibers of a portion of the fiber web to separate while the portion of the fiber web is receiving heat from said heating unit.

53. The apparatus according to claim 52, wherein said heating unit radiates heat on the portion of the web for less than approximately one second.

54. The apparatus according to claim 42, wherein said heating unit substantially completes differential heat shrinkage of the segments of the plural-component fibers of a portion of the web and resultant fiber separation, by applying heat to the portion of the web for approximately one second or less.

55. The apparatus according to claim 42, wherein said heating unit blows hot air and/or steam through the web.

56. The apparatus according to claim 42, wherein said heating unit applies radiant heat to said web.

57. The apparatus according to claim 42, wherein said spinneret extrudes plural-component fibers comprising polypropylene and polyethylene terepthalate modified with isopthalic acid and a powdered transesterification inhibitor.

58. The apparatus according to claim 42, further comprising an aspirator disposed between said spinneret and said web-forming surface, said aspirator attenuating the array of plural-component fibers extruded from said spinneret prior to the array of plural-component fibers being deposited onto the web-forming surface.

59. The apparatus according to claim 42, further comprising at least one godet to draw or relax the array of plural-component fibers.

60. An apparatus for forming a nonwoven fabric from a process employing fiber splitting in line with fiber extrusion, comprising:

a spinpack having a spinneret with an array of orifices configured to extrude an array of plural-component fibers each comprising first and second materials having a relative difference in heat shrinkage;

a web-forming surface moving relative to said spinneret and adapted to receive the array of plural-component fibers extruded from the orifices to form a fiber web on said web-forming surface;

a heating unit configured to apply heat to the array of plural-component fibers prior to deposition on said web-forming surface to cause differential heat shrinkage of the first and second materials, such that segments of the plural-component fibers comprising the first material separate from segments of the plural-component fibers comprising the second material; and

means for processing the web to form the nonwoven fabric.

61. The apparatus according to claim 60, wherein said spinneret extrudes plural component fibers comprising the first and second materials having a difference in heat shrinkage of at least approximately ten percent.

62. The apparatus according to claim 60, wherein said means for processing comprises means for bonding the web to form a spunbonded fabric.

63. The apparatus according to claim 62, wherein said means for bonding performs through-air bonding of the web by heating the web to a temperature at which segments formed of one of said first and second materials begin to melt and adhere to adjacent segments.

64. The apparatus according to claim 60, wherein said spinneret extrudes plural-component fibers comprising the first and second materials which are non-hydrophilic materials.

65. The apparatus according to claim 60, wherein said spinneret is configured to extrude ribbon-shaped plural-component fibers from the orifices.

66. The apparatus according to claim 65, wherein the ribbon-shaped plural-component fibers extruded from said spinneret comprise segments of the first material interleaved with segments of the second material.

67. The apparatus according to claim 66, wherein the ribbon-shaped plural-component fibers extruded from said spinneret are bicomponent fibers comprising alternating segments of the first material and segments of the second material.

68. The apparatus according to claim 60, wherein said spinneret is configured to extrude plural-component fibers having a cross section in the shape of a cross, including a central segment comprising the first material and a plurality of radial segments comprising the second material and extending radially outward from the central segment.

69. The apparatus according to claim 68, wherein the plural-component fibers extruded from said spinneret further include a plurality of radial segments comprising

the first material and extending radially outward from said plurality of radial segments comprising the second material.

70. The apparatus according to claim 60, wherein said heating unit substantially completes differential heat shrinkage of the segments of the plural-component fibers at a point along the plural-component fibers and resultant fiber separation, by applying heat at the point along the plural-component fibers for approximately one second or less.

71. The apparatus according to claim 60, wherein said heating unit blows hot air and/or steam through the array of plural-component fibers.

72. The apparatus according to claim 60, wherein said heating unit applies radiant heat to the array of plural-component fibers.

73. The apparatus according to claim 60, wherein said spinneret extrudes plural-component fibers comprising polypropylene and polyethylene terepthalate modified with isopthalic acid and a powdered transesterification inhibitor.

74. The apparatus according to claim 60, further comprising an aspirator disposed between said spinneret and said web-forming surface, said aspirator attenuating the array of plural-component fibers extruded from said spinneret prior to the array of plural-component fibers being deposited onto the web-forming surface.

75. The apparatus according to claim 74, wherein said aspirator serves as said heating unit and applies hot air and/or steam to the array of plural-component fibers to cause differential heat shrinkage of the segments of the plural-component fibers prior to reaching the web-forming surface.

76. The apparatus according to claim 60, further comprising at least one godet to draw or relax the array of plural-component fibers.

77. The apparatus according to claim 76, wherein said at least one godet serves as said heating unit and applies heat to the array of plural-component fibers to cause differential heat shrinkage of the segments of the plural-component fibers prior to reaching the web-forming surface.

78. A nonwoven fabric produced from a process employing fiber splitting in line with fiber extrusion, comprising:

first fiber segments comprising a first material extruded as a component of plural-component fibers; and

second fiber segments comprising a second material extruded as a component of the plural-component fibers while having a heat shrinkage different from a heat shrinkage of the first material;

wherein said first and second fiber segments have been at least partially separated from the second fiber segments by differential shrinkage induced by heat applied in line with fiber extrusion.

79. The nonwoven fabric according to claim 78, wherein said fabric is bonded to form a spunbonded fabric.

80. The nonwoven fabric according to claim 79, wherein said fabric is through-air bonded by at least partially melting one of said first and second fiber segments.

81. The nonwoven fabric according to claim 78, wherein said second material has a heat shrinkage different from a heat shrinkage of the first material by at least approximately ten percent.

82. The nonwoven fabric according to claim 78, wherein said first and second material are non-hydrophilic.

83. The nonwoven fabric according to claim 78, wherein said first material comprises polypropylene and the second material comprises polyethylene terepthalate modified with isopthalic acid and a powdered transesterification inhibitor.

84. The nonwoven fabric according to claim 78, wherein at least one of said first and second materials includes a fluoropolymer compound and/or silicone.

85. The nonwoven fabric according to claim 78, wherein one of said first and second materials includes a foaming agent to induce swelling.

86. The nonwoven fabric according to claim 78, wherein said first and second fiber segments are segments of ribbon-shaped fibers.

87. The nonwoven fabric according to claim 86, wherein the ribbon-shaped fibers are bicomponent fibers comprising alternating first fiber segments and second fiber segments.

88. The nonwoven fabric according to claim 78, wherein said first and second fiber segments are segments of plural-component fibers having a cross section in the shape of a cross, including a central segment comprising a first fiber segment and a plurality of radial segments comprising second fiber segments extending radially outward from the central segment.

89. The nonwoven fabric according to claim 88, wherein the plural-component fibers further include a plurality of radial segments comprising first fiber segments extending radially outward from said plurality of radial segments comprising second fiber segments.

90. A product comprising the nonwoven fabric according to claim 78 selected from the group consisting of: disposable absorbent articles; medical barrier fabrics; filtration media; and sheets of padding.

91. A plural-component fiber extruded from an orifice of a spinneret, comprising:
first segments comprising a first material component; and

second segments comprising a second material component having a heat shrinkage different from a heat shrinkage of the first material component;

wherein said first segments are separable from said second segments by application of heat in line with fiber extrusion to cause differential heat shrinkage of the first and second component materials.

92. The plural-component fiber according to claim 91, wherein said second material has a heat shrinkage different from a heat shrinkage of the first material by at least approximately ten percent.

93. The plural-component fiber according to claim 91, wherein said first and second material are non-hydrophilic.

94. The plural-component fiber according to claim 91, wherein said plural-component fiber is a ribbon-shaped fiber.

95. The plural-component fiber according to claim 94, wherein the ribbon-shaped fiber comprise alternating first and second segments.

96. The plural-component fiber according to claim 91, wherein said plural-component fiber has a cross section in the shape of a cross, including a central segment comprising a first segment and a plurality of radial segments comprising second segments and extending radially outward from the central segment.

97. The plural-component fiber according to claim 96, wherein said plural-component fiber further includes a plurality of radial segments comprising first segments and extending radially outward from said plurality of radial segments comprising second segments.

98. The plural-component fiber according to claim 91, wherein said first material component comprises polypropylene and the second material component comprises

polyethylene terepthalate modified with isopthalic acid and a powdered transesterification inhibitor.

99. The plural-component fiber according to claim 91, wherein at least one of said first and second material components includes a fluoropolymer compound and/or silicone.

100. The plural-component fiber according to claim 91, wherein one of said first and second material components includes a foaming agent to induce swelling.

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